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10/802,104

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Robert J. Crist

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EXAMINER

LUONG, VINH

ART UNIT

PAPER NUMBER

3682

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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3 MONTHS

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/802,104

Applicant(s)

CRIST, ROBERT J.

Examiner

Vinh T. Luong

Art Unit

3682

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11 and 24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11 and 24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.


Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/8/07, 12/4/06, 3/16/04 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.


Vinh T. Luong
Primary Examiner

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/04/06</u> . | 6) <input checked="" type="checkbox"/> Other: <u>Attachment</u> . |

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1. The Supplemental Amendment filed on January 8, 2007 has been entered.
2. Applicant's election without traverse of Group I and the species of FIGS. 1-6 in the reply filed on August 4, 2006 is acknowledged.
3. No claim is withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention and/or species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on August 4, 2006.
4. The drawings were received on January 8, 2007. These drawings are not accepted by the Examiner because the drawings are not in compliance with 37 CFR 1.84. For example:
 - (a) The view number "FIG. 6" must not be used in association with a bracket. See 37 CFR 1.84(u)(2);
 - (b) When a portion of a view is enlarged for magnification purposes, the view and the enlarged view must each be labeled as separate views. 37 CFR 1.84(h)(2). However, Applicant did not label the detailed figures C or D separately from "FIG. 6"; and/or
 - (c) The drawing symbols in FIG. 6 are inconsistent with each other. In fact, based on the drawing symbols for draftsman in MPEP 608.02, the same elastic element 36 is made of sand or the like, rubber or electrical insulation, and synthetic sponge as seen in Attachment.
5. The *original* drawings are objected to because the drawings do not comply with 37 CFR 1.84. For example:
 - (a) The sectional line, such as, S-S in FIG. 2 should have been changed to line 3-3 in order to correspond to FIG. 3. See 37 CFR 1.84(h)(3); and
 - (b) The drawings are inconsistent with the specification and the claims. The

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specification describes and claims 2-7 claim the fibers 46, however, the detailed figures C and D in FIGS. 6 show that the elements 46 are refractory material, not fibers in accordance with the drawing symbols for draftsperson in MPEP 608.02.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. New corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because of the objections above. Applicant is advised to employ the services of a competent patent draftsperson outside the Office, as the U.S. Patent and Trademark Office no longer prepares new drawings. The corrected drawings are required in reply to the Office action to avoid abandonment of the application. The requirement for corrected drawings will not be held in abeyance.

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7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. Claims 1-9, 11, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haga et al. (US Patent No. 6,345,430) in view of Harris' Shock and Vibration Handbook.

Regarding claim 1, Haga teaches a vibration damper for damping torsional and bending vibrations in a rotating shaft (a crankshaft. *Ibid.* col. 3, line 24-33) having an axis of rotation (unnumbered in the figure), the vibration damper comprising:

a hub 1 adapted to be coupled to the shaft for rotational movement therewith;

an inertia element 2 concentric with the hub 1; and

an elastic element 4 adapted to non-rigidly couple the hub 1 and the inertia

element 2.

Haga teaches the invention substantially as claimed. However, Haga does not explicitly teach that the material of the elastic element possesses different first and second shear modulus in first and second directions.

Harris' Shock and Vibration Handbook (hereinafter "Harris") teaches the well-known material (see, *e.g.*, Table 35.5 on pages 35.6 and 35.7) that possesses different first and second shear modulus in first and second directions (axial and transverse directions) in order to dampen the shock and vibration. See *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) and MPEP 2144.07.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the well known elastic material that possesses different first and

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second shear modulus in first and second directions in order to dampen the shock and vibration in Haga's damper as taught or suggest by Harris.

Regarding claim 2, Haga's elastic element 4 comprises a composite material. *Ibid.* col. 3, lines 34-45. In addition, Harris' material is also a composite material. See page 35.6

Regarding claim 3, Harris' composite material comprises an elastomer having a plurality of fibers dispersed therein. See, e.g., page 35.6.

Regarding claim 4, Harris' fibers are dispersed within the elastomer in a unidirectional orientation. See, e.g., last paragraph on page 35.6.

Regarding claim 5, Harris's plurality of fibers (carbon/graphite and Kevlar fibers) are dispersed within the elastomer in a longitudinal (axial) orientation with respect to the elastic element. See, e.g., last paragraph on page 35.6.

Regarding claim 6, Harris' plurality of fibers (carbon/graphite and Kevlar fibers) are dispersed within the elastomer in an axial orientation that is substantially parallel to the axis of rotation. See, e.g., last paragraph on page 35.6.

Regarding claim 7, Harris' plurality of unidirectional fibers are capable of being dispersed within the elastomer in a radial orientation with respect to the axis of rotation. See, e.g., page 35.3 wherein Harris teaches the orientation of fibers in the 0° , $+45^{\circ}$, -45° , and 90° . On the other hand, the orientation of Harris' unidirectional fibers in Haga's damper would have been a matter of choice in design since the claimed structures and the function they perform are the same as the prior art. *In re Chu*, 66 F.3d 292, 36 USPQ2d 1089 (Fed. Cir. 1995) citing *In re Gal*, 980 F.2d 717, 719, 25 USPQ2d 1076, 1078 (Fed. Cir. 1992).

Regarding claim 8, a first surface 6 located on Haga's inertia element 2 is spaced radially outwardly from a second surface 5 located on the hub 1, and the elastic element 4 is located between the first surface 6 and the second surface 5.

Regarding claim 9, an outer surface 2a of Haga's inertia element 2 is adapted to receive a power-transmitting belt. *Ibid.* col. 3, lines 42-45.

Regarding claim 11, an outer surface 1d of Haga's hub 1 is adapted to receive a power-transmitting belt. *Ibid.* col. 3, lines 42-45.

Regarding claim 24, Haga teaches a vibration damper for damping torsional and bending vibrations in a rotating shaft (a crankshaft. *Ibid.* col. 3, line 24-33) having an axis of rotation (unnumbered in the figure), the vibration damper comprising:

- a hub 1 adapted to be coupled to the shaft for rotational movement therewith;

- an inertia element 2 concentric with the hub 1; and

- an elastic element 4 adapted to non-rigidly couple the hub 1 and the inertia element 2.

Haga teaches the invention substantially as claimed. However, Haga does not explicitly teach that the anisotropic elastic material having different first and second shear modulus in first and second directions.

Harris' Shock and Vibration Handbook (hereinafter "Harris") teaches the well-known anisotropic elastic material (see, *e.g.*, pages 35.3 and 35.6, and TABLE 35.5 on page 35.7) that possesses different first and second shear modulus in first and second directions (axial and transverse directions) in order to dampen the shock and vibration. See *In re Leshin* and MPEP 2144.07, *supra*.

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It would have been obvious to one having ordinary skill in the art at the time the invention was made to select the well known anisotropic elastic material that possesses different first and second shear modulus in first and second directions in order to dampen the shock and vibration in Haga's damper as taught or suggest by Harris.

9. Applicant's arguments filed January 8, 2007 have been fully considered but they are not persuasive.

DRAWINGS

The proposed drawings have been disapproved. They are not in compliance with 37 CFR 1.84 as seen above.

35 USC 102(b)

To simplify the issues, the Examiner *sua sponte* withdraws the rejection under 35 USC 102(b). Applicant's arguments regarding this ground of rejection are deemed to be moot.

35 USC 103

At the outset, Applicant contended:

First, Applicant respectfully disagrees with the Examiner's contention that Harris teaches the "well-known material (see, e.g., Table 35.5 on pages 35.6 and 35.7) that possesses different first and second shear modulus in first and second directions..., in order to dampen shock and vibration." *Harris' Handbook at Table 35.5 teaches fibers that are "inherently anisotropic in themselves."* (Harris' pg. 35.6). The portion of the Harris Handbook identified by the Examiner, however, *does not appear* to teach the use of the anisotropic features of those fibers or, more importantly, the anisotropic features of a composite in which those fibers are embedded to dampen shock and vibration in multiple directions. Furthermore, Table 35.5 as relied upon by the Examiner lists axial and transverse "elastic" modulus rather than "shear" modulus of the fibers. (Emphasis added).

The Examiner respectfully submits that Applicant's contentions are unsupported by substantial evidence in the record. On the one hand, Applicant admitted that "*Harris' Handbook at Table 35.5 teaches fibers that are 'inherently anisotropic in themselves.'*" Applicant also uses the anisotropic elastic material in the same manner taught by Harris as evidenced in new claim 24. Therefore, Applicant's material inherently behaves in the same manner as Harris's anisotropic material listed in Table 35.5. See *In re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986) and *In re Best*, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977) and MPEP 2112. On the other hand, Table 35.5 listed the fibers such as E-glass, S-glass, Kevlar, and AS4 carbon. Harris' Table 35.5 shows two column "Axial elastic modulus" and "Transverse elastic modulus." As seen in this Table, the axial elastic modulus and the transverse elastic modulus of the listed fibers are different in axial and transverse directions. Therefore, the shear modulus of the listed fibers in axial and transverse directions are different therewith because the shear modulus is proportional to the elastic modulus or Young's modulus. This fact is notoriously well known based on standard textbooks of material science or scientific dictionary as evidenced by, e.g., the description of "Relation to Poisson's ratio and Young's modulus" in the free encyclopedia *Wikipedia* attached.

With respect to Applicant's allegation that "[t]he portion of the Harris Handbook identified by the Examiner, however, *does not appear* to teach the use of the anisotropic features of those fibers or, more importantly, the anisotropic features of a composite in which those fibers are embedded to dampen shock and vibration in multiple directions," contrary to Applicant's remarks, the portion of the Harris Handbook identified by the Examiner such as Table 35.5 clearly teaches the use of the anisotropic features of those fibers to dampen shock and vibration

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in multiple directions. In fact, Harris explained below Table 35.5: "Typical fibers properties are presented in Table 35.5, where the degree of *individual fiber anisotropy* is indicated." At the first glance, Harris' handbook has the title "Shock and Vibration Handbook." Specifically, Chapter 35 of this handbook teaches the use of composite materials for dampening shock and vibration. Applicant is respectfully referred to, *inter alia*, Harris' page 35.3+ and FIGS. 35.4-35.6 wherein Harris teaches "Special Design Issues and Opportunities" in multiple directions. In addition, pages 35.12-35.18 of Harris explicitly discusses about the composite in which those fibers are embed to dampen the vibration in multiple direction, particularly, the shear coupling or shear modulus. It is noteworthy that by using the hedging words "*does not appear to teach . . .*," Applicant did not positively affirm that Harris does not teach the use of the anisotropic features of those fibers to dampen shock and vibration in multiple directions. Simply put, Applicant's vague denial of Harris' teachings is unsupported by the totality of the teachings set forth in Harris' Shock and Vibration Handbook.

Second, Applicant contended that the Examiner fails to identify a proper motivation to combine the particular relied on for the §103 rejection.

The Examiner respectfully submits that MPEP 2144.07 states:

The selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945) (Claims to a printing ink comprising a solvent having the vapor pressure characteristics of butyl carbitol so that the ink would not dry at room temperature but would dry quickly upon heating were held invalid over a reference teaching a printing ink made with a different solvent that was nonvolatile at room temperature but highly volatile when heated in view of an article which taught the desired boiling point and vapor pressure characteristics of a solvent for printing inks and a catalog teaching the boiling point and vapor pressure characteristics of

butyl carbitol. "Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig-saw puzzle." 325 U.S. at 335, 65 USPQ at 301.).

See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) (selection of a known plastic to make a container of a type made of plastics prior to the invention was held to be obvious); *Ryco, Inc. v. Ag-Bag Corp.*, 857 F.2d 1418, 8 USPQ2d 1323 (Fed. Cir. 1988)(Claimed agricultural bagging machine, which differed from a prior art machine only in that the brake means were hydraulically operated rather than mechanically operated, was held to be obvious over the prior art machine in view of references which disclosed hydraulic brakes for performing the same function, albeit in a different environment.).

Here, the thrust of Applicant's invention is the elastic element that has different shear modulus in different directions. The Court has long laid Applicant's arguments to rest by pointing out that the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness. Applicant has not provided any secondary evidence to show, e.g., unexpected results, long felt needs, etc. Therefore, Applicant has not overcome the *prima facie* case of obviousness in the instant case.

In addition, the Court reiterated in *Alza Corp. v. Mylan Laboratories Inc.*, 80 USPQ2d 1001 (Fed. Cir. 2006): "[t]he test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." (*Id.* at 1004). See also *Ormco Corp. v. Align Technology Inc.*, 79 USPQ2d 1931 (Fed. Cir. 2006) and *In re Johnston*, 77 USPQ2d 1788 (Fed. Cir. 2006). In the case at hand, the nature of the problem to be solved by Haga is the dampening of the vibration. Harris's handbook is dealt with this problem.

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Consequently, one having ordinary skill in the art facing the damping vibration problem would look into the teachings of Haga and Harris.

With respect to Applicant's hindsight arguments, the Court in *Alza Corp. v. Mylan Laboratories Inc.*, *supra* stated:

The Court of Appeals for the Federal Circuit's and its predecessor's "motivation to combine" requirement likewise prevents statutorily proscribed hindsight reasoning when determining the obviousness of an invention. *Kahn*, 441 F.3d at 986 ("[T]he 'motivation-suggesting-teaching' requirement protects against the entry of hindsight into the obviousness analysis."); *In re Fridolph*, 30 CCPA 939, 942 (1943) ("[I]n considering more than one reference, the question always is: does such art suggest doing the thing the [inventor] did."). According to the "motivation-suggesting-teaching" test, a court must ask "whether a person of ordinary skill in the art, possessed with the understandings and knowledge reflected in the prior art, and motivated by the general problem facing the inventor, would have been led to make the combination recited in the claims." *Kahn*, 441 F.3d at 988 (citing *Cross Med. Prods., Inc. v. Medtronic Sofamor Danek, Inc.*, 424 F.3d 1293, 1321-24 [76 USPQ2d 1662] (Fed. Cir. 2005)).

In this case, one must ask whether the person of ordinary skill in the art, possessed with the understandings and knowledge reflected in the art of vibration damping and motivated by the general problem facing the inventor, *i.e.*, damping the vibration, would have been led to make the combination recited in the claims. Since the Haga and Harris are in the same field of endeavor, face the same problem of damping the vibration, and solve it substantially in the same way (by an anisotropic elastic material, *a fortiori*, the "motivation-suggesting-teaching" requirement is fully satisfied. The entry of hindsight into the obviousness analysis is fully protected as set forth by the Court.

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With respect to claim 2, Haga or Harris teaches the composite material as explained above.

With respect to claims 6 and 7, Applicant disagreed that Harris' handbook teaches fibers dispersed within the elastomer in axial orientation that is substantially parallel to the axis of rotation or in a radial orientation with respect to the axis of rotation.

Contrary to Applicant's assertion, the substantial evidence in the record shows that, e.g., page 35.3 of Harris teaches the orientation of fibers in the 0° , $+45^{\circ}$, -45° , and 90° . To choose among different orientations of Harris' fibers would have been an obvious matter of choice in design since the claimed structures and the function they perform are the same as the prior art. *In re Chu, supra*. See also *In re Japikse*, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) and *In re Kuhle*, 56 F.2d 553, 188 USPQ 7 (CCPA 1975).

With respect to Applicant's contention that Harris does not mention about the rotating shaft, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As seen in the rejections above, Haga is used to show the teachings of the rotating shaft and Harris is used to show the anisotropic elastic material. Therefore, the combination of Haga and Harris meets the claims.

For the foregoing, Applicant's solicitation of a notice for allowance is respectfully denied.

10. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vinh T. Luong whose telephone number is 571-272-7109. The examiner can normally be reached on Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

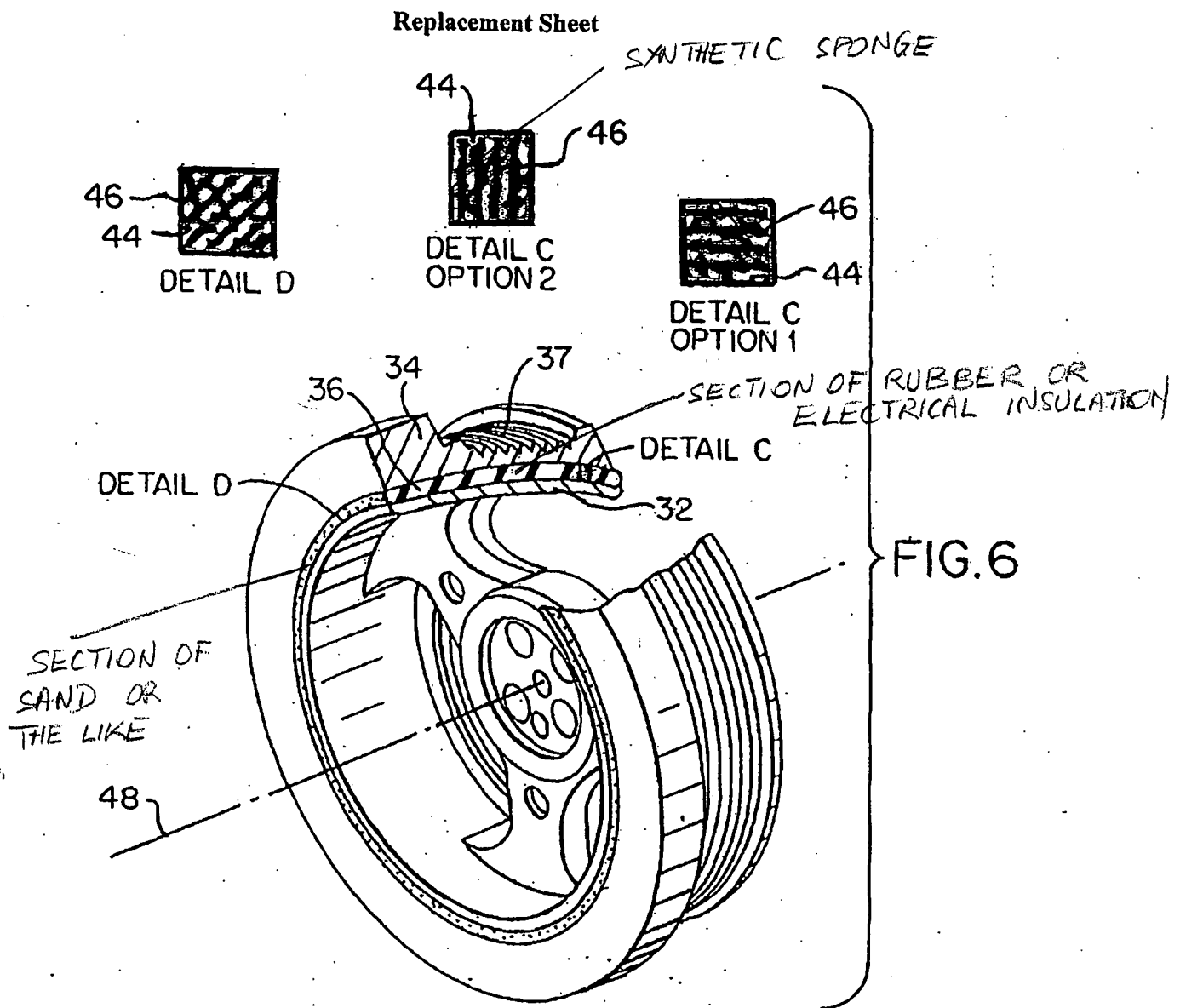
Luong

March 5, 2007



Vinh T. Luong
Primary Examiner

ATTACHMENT



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